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LOLLIGUNCULA ARGUS, A NEW SPECIES OF LOLIGINID SQUID (CEPHALOPODA: MYOPSIDA) FROM THE TROPICAL EASTERN PACIFIC

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Abstract.—A new species of myopsid squid, *Lolliguncula argus,* is described from the tropical eastern Pacific. It is characterized by its small size at maturity (males 20.8–*26.8*–29.6 mm ML, females 20.6–*32.3*–38.8 mm ML), the lack of buccal suckers, and it is the only known myopsid to have its primary hectocotylization on the right ventral arm instead of the left.

Among the cephalopods collected during a cruise of the M/V *Argosy* off the coast of Ecuador, were several unidentifiable lots of small but mature loliginids. Detailed examination showed that these were best referred to the genus *Lolliguncula* Steenstrup, 1881, but they were neither *L. panamensis* Berry, 1911, nor *L. tydeus* Brakoniecki, 1980. These small distinctive squids represent, therefore, an undescribed species.

All measurements (in mm) and indices are as defined by Roper and Voss (1983), with the following addition:

VLI—vane length index—length of the vanes from the anterior vane insertions to the posterior end of the gladius as a percentage of gladius length.

CBLI—cement body length index—length of cement body as a percentage of spermatophore length.

Lolliguncula argus, new species
Figs. 1, 2

Material examined.—Holotype: male ML 28.6 mm, M/V *Argosy* sta 85, La Plata Is., Ecuador, 01°16′S 81°05′W, 10 Oct 1961, USNM 815750. Paratypes: 2 males ML 20.8–29.6 mm, 1 female ML 38.8 mm, taken with holotype, UMML 31.1822.—3 females ML 34.0–35.4 mm, M/V *Argosy* sta 49, La Plata Is., Ecuador, 29 Sep 1961, USNM 815751.—7 males ML 26.0–28.2 mm, 3 females ML 20.6–32.3 mm, M/V *Argosy* sta 63, La Plata Is., Ecuador, 3 Oct 1961, USNM 815752.—3 females ML 31.4–33.8 mm, M/V *Argosy* sta 79, La Plata Is., Ecuador, 9 Oct 1961, USNM 815753. Other material: 13 males M/V *Argosy* sta 45, La Plata Is., Ecuador, 28 Sep 1961, UMML 31.1823.—1 male, 5 females, M/V *Argosy* sta 49, La Plata Is., Ecuador, 29 Sep 1961, UMML 31.1824.—5 males, 2 females, M/V *Argosy* sta 52, La Plata Is., Ecuador, 30 Sep 1961, UMML 31.1825.—9 males, 1 female, M/V *Argosy* sta 67, La Plata Is., Ecuador, 5–6 Oct 1961, UMML 31.1826.—1 male, 1 female, M/V *Argosy* sta 69, La Plata Is., Ecuador, 6 Oct 1961, UMML 31.1827.—87 males, 14 females, M/V *Argosy* sta 79, La Plata Is., Ecuador, 9 Oct 1961, UMML 31.1828.—2 males, taken with holotype, UMML 31.1829.—1 female, Los Frailes, B. C., Mexico, 23°21′N, 109°25′W, 24 Mar 1957, UMML 31.1830.—5 males, 5 females, Scripps Institution Acc. No. BI-65-I. RR 65-50 +

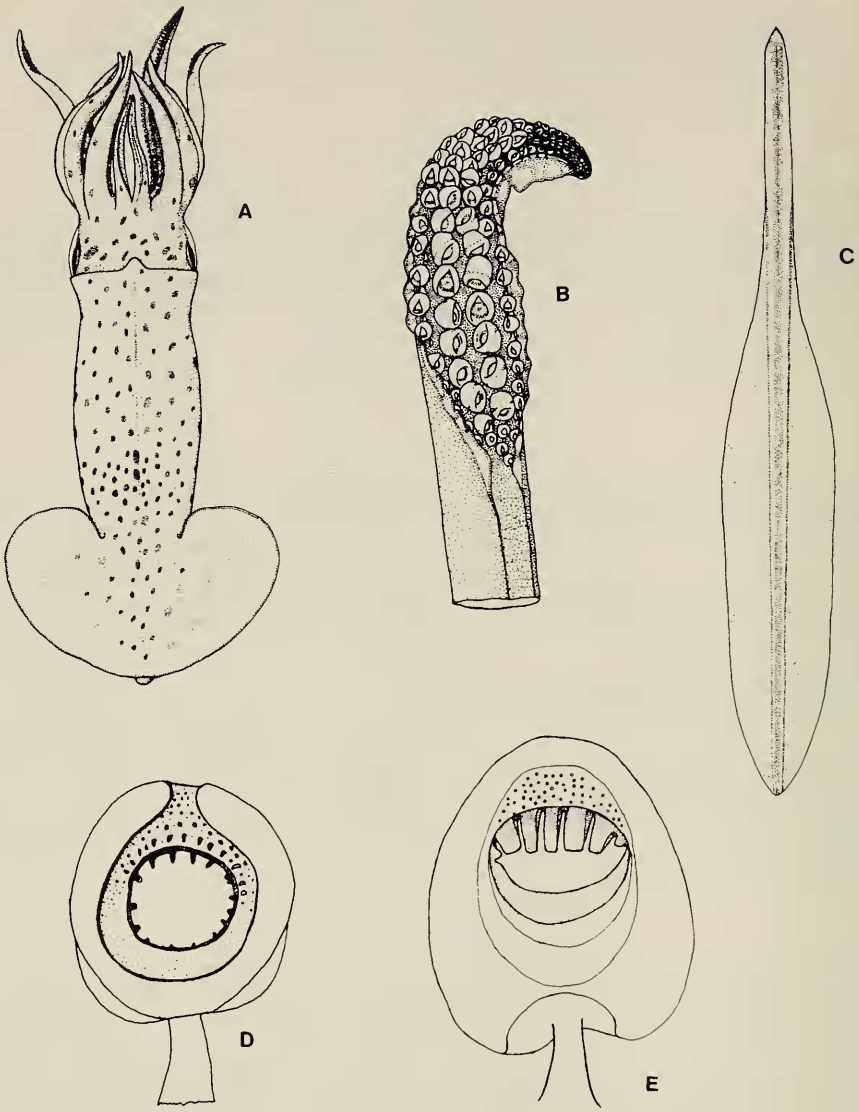

Fig. 1. *Lolliguncula argus:* A, Dorsal view of holotype 28.6 mm ML, USNM 815750; B, Tentacular club from female 33.8 mm ML, USNM 815753; C, Gladius from male 27.6 mm ML, USNM 815752; D, Large tentacular sucker from median row of female 33.8 mm ML, USNM 815753; E, Sucker from right arm III row 7 of male 29.6 mm ML, UMML 31.1822.

51, Bahia Santo Inez, Mexico, 26°56.0′N, 11°50.9′W to 26°59.9′N, 111°58.8′W, 14 Jul 1965.

Description.—The mantle is short, cylindrical and bluntly pointed posteriorly. Females generally are larger than males at maturity (ML males 20.8–*26.8*–29.6 mm, females 20.6–32.3–38.8). The mantle width is about ⅓ of the length (MWI males 31.1–*33.5*–35.6, females 25.7–*30.4*–34.4). The anterior margin is wide, slightly flared, with a distinct dorsal lappet marking the anterior end of the gladius.

Table 1.—Measurements (in mm) and indices of ten *Lolliguncula argus*, new species (holotype ML = 28.6 mm).

ML	20.8	26.0	26.2	26.8	27.0	27.2	27.6	28.2	28.6	29.6
MWI	35.6	33.8	33.6	33.6	33.3	35.3	34.1	31.2	33.6	31.1
HWI	33.7	33.1	32.1	33.6	34.1	35.3	34.8	33.3	32.9	31.8
FLI	26.0	26.2	31.3	29.9	26.7	25.7	26.8	24.8	28.0	25.0
FWI	48.1	49.2	45.8	50.0	44.4	44.8	54.3	46.8	53.1	47.3
ALI I	27.2	22.3	24.4	22.4	21.5	21.3	21.7	21.3	24.5	20.9
ALI II	37.5	30.0	33.6	29.9	31.1	31.6	33.3	29.1	34.3	31.1
ALI III	47.1	37.7	34.4	35.1	33.3	32.4	36.2	31.2	39.9	35.1
ALI IVr	52.9	50.0	46.6	47.8	45.9	45.6	49.3	44.7	45.5	45.3
ALI IVl	34.6	33.1	35.9	33.6	—	31.6	33.3	30.5	32.9	33.1
HcLI	60.0	64.6	65.6	60.9	64.5	64.5	67.2	63.5	56.9	58.2
TtLI	76.9	36.9	—	42.5	36.3	39.7	43.5	41.8	44.1	39.9
ClLI	27.9	16.2	—	17.9	14.8	14.7	15.9	15.6	20.3	17.6
GWI	—	—	19.1	15.6	17.8	17.4	18.6	—	—	—
VLI	—	—	64.1	66.7	65.2	70.3	72.9	—	—	—
RWI	—	—	5.3	4.4	5.9	5.1	4.3	—	—	—

The ventral margin is deeply indented ventral to the funnel, with pointed lappets at the location of the mantle–funnel locking apparatus.

The fins are small, nearly elliptical in outline, their length about ¼ and their width about ½ of the mantle length (FLI males 24.8–*27.0*–31.3, females 24.3–*27.3*–29.9; FWI males 44.4–*48.4*–53.1, females 45.2–*49.0*–52.2).

Head width is about ¼ to ⅓ of the mantle length and is slightly narrower in mature females than in mature males (HWI males 31.8–*33.5*–35.3, females 25.7–*28.3*–31.0).

The funnel is short and stout. The mantle-funnel locking apparatus is of the simple, straight, ridge-and-groove type. The dorsal member of the funnel organ is ∧-shaped and the ventral pads are small, oval.

The buccal membrane is 7-lobed with supports attached dorsally on arms I and II and ventrally on arms III and IV. The lobes are reduced in size and buccal

Table 2.—Measurements (in mm) and indices of ten females of *Lolliguncula argus*, new species.

ML	20.6	28.6	31.4	32.2	33.4	33.8	34.0	35.0	35.4	38.8
MWI	34.0	33.6	33.1	29.2	29.9	30.8	29.4	25.7	29.9	28.3
HWI	30.1	28.7	27.4	28.0	29.9	29.0	27.1	25.7	31.0	26.3
FLI	24.3	25.9	28.0	29.2	29.9	26.7	26.5	26.3	26.6	29.4
FWI	44.7	49.0	52.2	47.8	48.5	52.1	50.6	48.0	45.2	51.5
ALI I	19.4	20.3	19.1	20.5	19.8	17.8	19.4	17.1	19.2	17.5
ALI II	28.2	31.5	28.7	28.6	28.1	27.2	30.0	24.0	—	25.8
ALI III	31.1	34.3	29.9	32.9	31.1	29.7	33.5	29.7	29.9	27.8
ALI IVr	27.2	26.6	28.7	28.0	26.9	28.4	27.1	26.9	28.2	26.8
ALI IVl	28.2	27.3	28.7	28.0	27.5	26.7	26.5	27.4	27.7	27.3
TtLI	37.9	29.4	37.6	39.1	32.3	27.8	38.2	37.7	41.2	29.9
ClLI	19.4	14.7	16.6	15.5	14.4	14.8	11.8	13.1	14.1	15.5
GWI	—	16.6	—	—	—	—	—	—	—	17.4
VLI	—	72.4	—	—	—	—	—	—	—	70.8
RWI	—	4.1	—	—	—	—	—	—	—	3.1

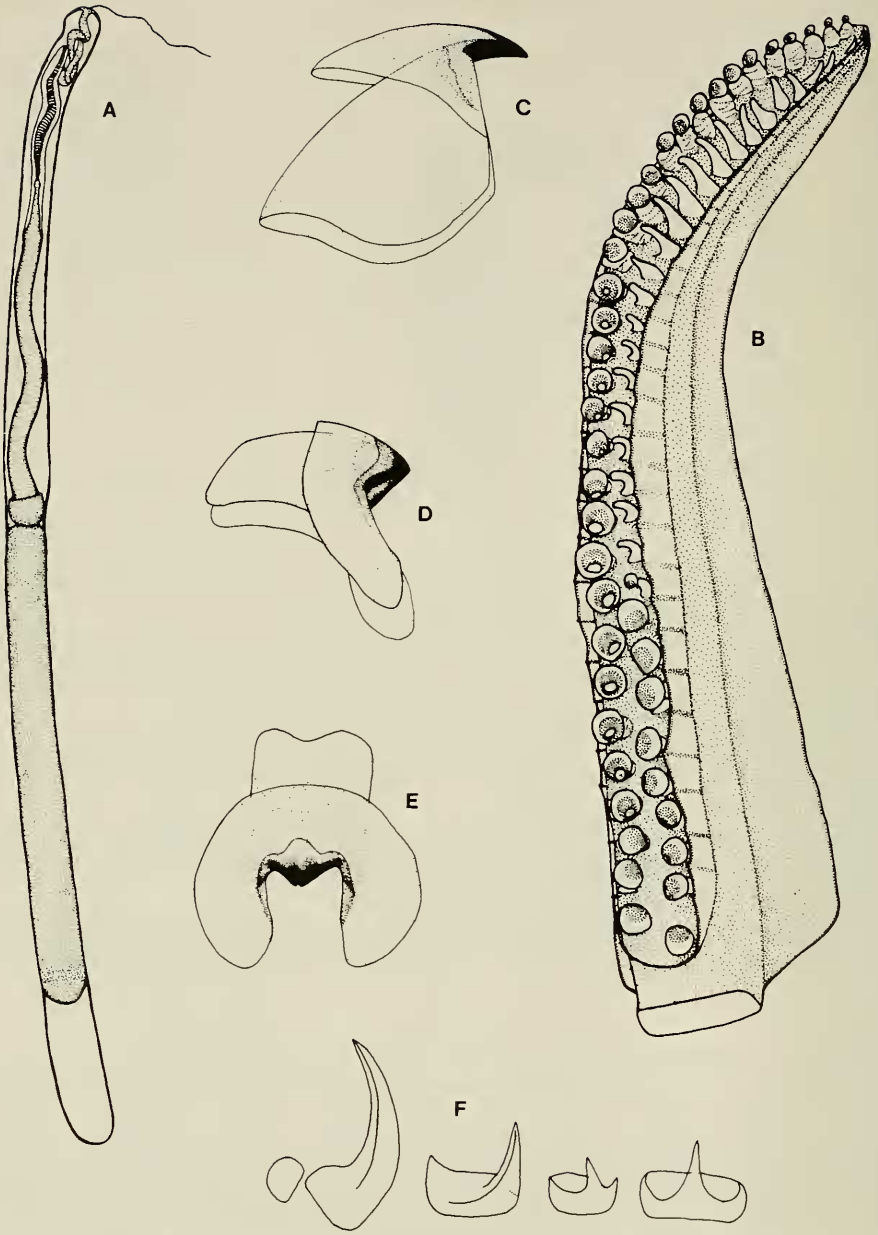

Fig. 2. *Lolliguncula argus:* A, Spermatophore from holotype 28.6 mm ML, USNM 815750; B, Hectocotylus from same; C, upper beak from male 26.8 mm ML, USNM 815752; D, E, Lower beak from same; F, Radula from same.

suckers are lacking. Spermatophores are implanted in females on a spermatophore receptacle on the ventral part of the buccal membrane and on the gills. Spermatophores on the gills generally are concentrated on the anterior lobe of the right gill.

Table 3.—Summary of indices of *Lolliguncula argus*, new species (n = 10 males, 10 females).

Index	Range and mean males	Range and mean females
Mantle length	20.8–*26.8*–29.6	20.6–*32.3*–38.8
MWI	31.1–*33.5*–35.6	25.7–*30.4*–34.0
HWI	31.8–*33.5*–35.3	25.7–*28.3*–31.0
FLI	24.8–*27.0*–31.3	24.3–*27.3*–29.9
FWI	44.4–*48.4*–53.1	45.2–*49.0*–52.2
ALI I	20.9–*22.8*–27.9	17.1–*19.0*–20.5
ALI II	29.1–*32.2*–37.5	24.0–*28.0*–31.5
ALI III	31.2–*36.2*–47.1	27.8–*31.0*–34.3
ALI IVr	44.7–*47.4*–52.9	26.6–*27.5*–28.7
ALI IVl	30.5–*33.2*–35.9	26.5–*27.5*–28.7
HcLI	56.9–*62.6*–67.2	—
TtLI	36.3–*44.6*–76.9	27.8–*35.1*–41.2
ClLI	14.7–*17.9*–27.9	11.8–*15.0*–19.4
GWI	15.6–*17.7*–19.1	—
VLI	64.1–*67.8*–72.9	—
RWI	4.3– *5.0*– 5.9	—

The arms are of moderate length and in the order III.II ≥ IV.I in females and IVr.III.IV1.II.I in males. The arms of mature males generally are longer than those of mature females (Table 3). Dorsal and ventral protective membranes border the sucker rows on all of the arms. The suckers are small and biserially arranged. The sucker rings have about 5 long, blunt teeth on the distal margins; the proximal margins are smooth (Fig. 1E). The proximal suckers on arms I, II, and III are enlarged in males.

The right ventral arm is hectocotylized (Fig. 2B) in males for about ⅔ of its length distally (HcLI 56.9–*62.6*–67.2). About 7 to 9 pairs of normal suckers lie proximally, then the dorsal suckers become greatly reduced in size and are located on small, narrowly triangular pedicels. Only the first 2 or 3 of the modified suckers retain their chitinous rings. The dorsal suckers disappear completely around row 18 or 19, followed distally by pedicels that become markedly longer and thicker until row 21 or 22, then diminishing in size to the arm tip. The only modification to the ventral suckers consists of a slight increase in the length and thickness of their pedicels in the distalmost 10–15 rows. The hectocotylized arm is significantly longer than its unmodified fellow arm (OAI 29.8%–*43.0%*–52.8%).

Tentacular stalks are short and compressed, each with a dorsal keel that expands into a swimming membrane at the base of the club. A median groove extends along the oral surface to the base of the club where the margins diverge to form

Table 4.—Ranges and means of indices of ten spermatophores taken from each of four males (holotype ML = 28.6 mm).

ML	SpLI	CBLI	SMLI
20.8 mm	7.7–*7.9*–8.0	27.4–*27.9*–28.4	37.0–*38.5*–40.7
24.0 mm	6.8–*7.0*–7.3	28.9–*30.0*–30.6	35.7–*37.9*–40.0
26.2 mm	6.9–*7.0*–7.2	27.2–*28.1*–28.3	37.4–*38.7*–39.6
28.6 mm	6.5–*6.6*–6.7	28.4–*29.3*–30.1	40.4–*41.9*–44.1

the 2 protective membranes. A distinct manus and dactylus are present but there is no distinguishable caprus (Fig. 1B). About 22 to 27 transverse rows of suckers are arranged in 4 longitudinal rows. The suckers of the manus are enlarged, with those of the marginal rows about ½ the size of the median ones. The chitinous sucker rings have regularly spaced, pointed teeth that are longest on the distal margins of the median suckers (Fig. 1D) and on the outer lateral margins of the marginal suckers.

Spermatophores (Fig. 2A) were removed from 4 males of mantle lengths 20.8, 24.0, 26.2, and 28.6 mm. The spermatophores are small and thin; their lengths vary from 1.6 to 1.9 mm (SpLI 6.5–8.0). The cement body is long and slender and occupies slightly less than ⅓ of the spermatophore length (CBLI 27.2–30.6). The sperm mass occupies slightly over ⅓ of the spermatophore length (SMLI 35.7–44.1). Ranges and means of spermatophore indices are given in Table 4.

The free rachis of the gladius (Fig. 1C) is long with straight, convergent borders; it ends anteriorly in an acute point (RWI 4.3–*5.0*–5.9; VLI 64.1–*67.8*–72.9). The anterior vane extensions are short, narrow and poorly demarcated from the rachis. The anterior vane shoulders are convex. The lateral vane borders are long and straight to slightly concave (GWI 15.6–*17.7*–19.1). A slightly thickened band arises along the margin of the anterior vane shoulder and extends to the posterior tip of the gladius, obliquely bisecting each vane.

The radula has 7 transverse rows of teeth; marginal plates present. The central and lateral teeth and plate of only one side of one row were drawn (Fig. 2F). The beaks are generally light in color, but some variation exists (Fig. 2C, D, E). No angle point or tooth occurs in the jaw angle of the lower beak.

Distribution.—*Lolliguncula argus* is known from the coastal waters of the eastern Pacific Ocean from La Plata Island, Ecuador to the Gulf of California, Mexico. *Lolliguncula argus* appears to be a tropical species and, therefore, it seems unlikely that the range limits will extend very far to the north or south of the current records. All known specimens were taken at or near the surface.

Holotype.—Male ML 28.6 mm, National Museum of Natural History, USNM 815750.

Type-locality.—La Plata Island, Ecuador, 01°16′S, 81°05′W, 10 Oct 1961, night light dip net.

Etymology.—The specific name honors the ship M/V *Argosy.*

Discussion.—Several characters can be used to separate *Lolliguncula argus* from the other species of *Lolliguncula* known to occur in the coastal waters of the Americas: *L. brevis* (Blainville, 1823), *L. panamensis* Berry, 1911, and *L. tydeus* Brakoniecki, 1980. Unlike the other species, *Lolliguncula argus* has no suckers on the lobes of the buccal membrane. Male specimens of *Lolliguncula argus* have enlarged proximal suckers on arm pairs I, II, and III, while the males of the other species have no enlarged suckers. The eastern Atlantic species, *Lolliguncula mercatoris* Adam, 1941, also lacks buccal suckers and males have enlarged proximal suckers on arms II and III. *Lolliguncula mercatoris,* however, has two rows of long, fleshy papillae on its hectocotylus. On the hectocotylus of *Lolliguncula argus,* like the other American lolliguncula, only the dorsal sucker row is modified into long, fleshy papillae while the ventral row is unmodified. *Lolliguncula argus* is the only known myopsid to have its primary hectocotylization on the right ventral arm instead of the left.

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